

Chapter V
One-Way ANOVA

Exercises

Part I:

1.

A consumer wanted to investigate if four insurance companies differed with regard to the premium they charge for car insurance. The agency randomly selected a few car drivers who were insured by each of these companies and had similar driving records, cars, and insurance policies. The following table gives the premiums paid per month by these drivers insured with these four insurance companies:

Company A	Company B	Company C	Company D
75	59	65	76
83	75	70	60
68	100	97	52
52		90	58
		73	

(Suppose that assumptions required to perform a one-way analysis of variance have been tested positively.)

Using the 1% significance level, test the hypothesis that the mean car insurance premium paid per month by all drivers insured by each of these four companies is the same.

2.

A national transportation safety agency of a certain country wants to examine the safety of compact cars, midsize cars, and full-size cars. It collects a sample of three for each of the three car types.

Using the hypothetical data provided below, test with a significance level of 5% whether the mean pressure applied to the driver's head during a crash test is equal for each type of car.

Compact Cars	Midsize Cars	Full-size Cars
643	469	484
655	427	456
702	525	402

If you fail to reject the hypothesis that the means are all statistically equal conduct separate tests to determine which mean(s) is/are different.

Part II: SPSS

1.

A research group wants to examine the efficiency of three weight reducing methods. Three groups of persons will be randomly selected and put on diet. After 4 months the reduction in each person's weight is recorded. The results are:

Method	Method	Method
1	2	3
10	6	5
12	8	9
9	3	12
15	0	8
13	2	4

1. Create an SPSS data file. Call it *weight.sav*
2. Test the claim at a significance level of 5% that there is no difference among the means.

2.

Data Set: GSS2007R.sav

1. Verify the following statement:

“The share of unemployed youth to total unemployed (per cent for males) [*ythunemm*] satisfies the level of measurement requirement for the dependent variable and degree of urbanization [*urbanize*] satisfies the level of measurement requirement for the independent variable for one-way analysis.”

2. Perform a one-way analysis of variance with the data for degree of urbanization [*urbaniz*] and share of unemployed youth to total unemployed (per cent for males) [*ythunemm*].
Test the conditions for using one-way analysis of variance to make inferences about the mean differences in the populations represented by the groups in the sample

In case the data for degree of urbanization [*urbaniz*] and share of unemployed youth to total unemployed (per cent for males) [*ythunemm*] do not satisfy the conditions for using one-way analysis of variance, identify the correct transformation to use for our effort to satisfy the ANOVA conditions.

3. Based on the one-way analysis of variance, verify the following Hypothesis:

“The mean share of unemployed youth to total unemployed (per cent for males) is equal for all the populations represented by the groups of the variable degree of urbanization.”

4. Verify the following statement:

“Countries where the degree of urbanization was in the bottom third of all nations had a different share of unemployed youth to total unemployed (per cent for males) than those where the degree of urbanization was in the top third of all nations.”

5. Verify the following statement:

“The mean "share of unemployed youth to total unemployed (per cent for males)" for countries where the degree of urbanization was in the middle third of all nations was not statistically different for the mean for those where the degree of urbanization was in the top third of all nations.”

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